

US Army Corps of Engineers

Toxic and Hazardous
Materials Agency

FINAL
CETHA-IR-CR-90171(A)

Preliminary Assessment Report Addendum for Fort Pickett, VA

Contract Number DAAA15-90-D-0009
Delivery Order 10

March 1992

Prepared for:

U.S. ARMY TOXIC AND
HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground
Maryland 21010-5401

C479M

Prepared by:



Roy F. Weston, Inc.
West Chester
Pennsylvania 19380

FINAL

USATHAMA DELIVERY ORDER 10

PRELIMINARY ASSESSMENT REPORT

ADDENDUM

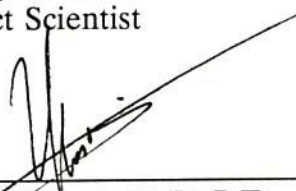
for

FORT PICKETT, VA


Contract Number DAAA15-90-D-0009



John F. Nist
Project Scientist



Yakir J. Hasit, PhD, P.E.
Project Manager



Frank J. Finger, II, P.E.
Deputy Program Manager

March 1992

Prepared By:

ROY F. WESTON, INC.
1 Weston Way
West Chester, Pennsylvania 19380

W.O. 2281-11-10-0004

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 2/28/92	3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE Preliminary Assessment Report Addendum for Fort Pickett			5. FUNDING NUMBERS DAAA15-90-D-0009 Deliver Order 10	
6. AUTHOR(S) Mr. John F. Nist				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Roy F. Weston, Inc. 1 Weston Way West Chester, PA 19380			8. PERFORMING ORGANIZATION REPORT NUMBER 2281-11-10-0004	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Headquarters, U.S. Army Garrison Fort Pickett Blackstone, VA 23824-5000			10. SPONSORING/MONITORING AGENCY REPORT NUMBER CETHA-IR-CR-90171(A)	
11. SUPPLEMENTARY NOTES None				
12a. DISTRIBUTION/AVAILABILITY STATEMENT U.S. Government Agency only. All other requests should be directed to the installation commander.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) previously contracted WESTON to address EPA Region III Preliminary Assessment Deficiency notifications for Fort Pickett. All deficiencies were addressed in accordance with the latest EPA guidance and the information was provided to USATHAMA and Fort Pickett for forwarding to EPA Region III. EPA then revised its guidance by finalizing the revised version of the Hazard Ranking System (HRS) in February, 1991. This revision required that more detailed information be provided by Fort Pickett for ranking and to determine if Fort Pickett is eligible for placement on the National Priority List (NPL). This report addresses additional Preliminary Assessment deficiencies for Fort Pickett and provides the information necessary for revised HRS scoring. This report covers: 1) Overview/Site History; 2) Waste/Source Information; 3) Groundwater Pathway Information; 4) Surface Water Pathway Information; 5) Air Pathway Information; and 6) Soil-Exposure Pathway Information.				
14. SUBJECT TERMS Fort Pickett, CERCLA, Hazardous Substances, Hazardous Waste			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited	

INTRODUCTION

This Preliminary Assessment Report Addendum has been prepared to provide additional information for assisting US EPA in scoring the facility using the rHRS system to determine whether further action is required under CERCLA.

This Addendum contains the followings sections:

1. Overview/Site History
2. Waste/Source Information
3. Groundwater Pathway Information
4. Surface Water Pathway Information
5. Air Pathway Information
6. Soil-Exposure Pathway Information
7. References

HRS SCORING DEFICIENCY RESPONSES

EPA ID# VA0213720705
Federal Facility ID# VA0213720705
Facility Name Fort Pickett

City Blackstone State VA Zip 23824

1. OVERVIEW/SITE HISTORY

1A. Reports submitted to EPA are referenced and copies of each reference are provided.

References in this Preliminary Assessment Update are attached to these responses. Any available references from the previous Preliminary Assessment have also been attached in response to this deficiency.

1D. Describe any releases of hazardous substances, pollutants, or contaminants to groundwater, surface water, soil, or air and provide sampling results with detection limits, laboratory methods, and quality assurance procedures.

Groundwater from monitor wells surrounding Fort Pickett's current landfill are sampled quarterly for general characteristics and metals. Results are attached.[1] Groundwater from monitor wells surrounding Landfill No. 2 (closed in 1982) were sampled for BNA's, explosives, pesticides, PCB's, herbicides, organics, metals and other non-metals. The results were sent to the Virginia State Water Control Board and the Virginia Department of Waste Management. None of the sampling efforts showed groundwater contamination and no comments or problems were ever expressed by these state agencies.[2] Results are attached.[3]

1F. Describe any prior spills (e.g., quantity of the spill, hazardous substances) that occurred at the facility.

In 1981, an estimated 15 gallons of PCB fluids spilled from a transformer near Building 1082.[4] The area was sampled for various PCB's and the levels found range from 5.6 to 23.3 ppm. Results are attached.[5] In 1982, an estimated 20 gallons of PCB fluids spilled from a transformer near Building 4072.[4] Soil sampling results (attached) from this spill event showed PCB levels below 1 ppm.[6]

2. WASTE/SOURCE INFORMATION (see Section 2 of the HRS Final Rule - December 1990 Federal Register)

2F. Determine the depth at which wastes were deposited in each source.

Both active and inactive landfills on Fort Pickett are the trench and fill type with wastes being deposited 15-20 ft. deep.[2]

HRS SCORING DEFICIENCY RESPONSES

Original
Use

Facility Name Fort Pickett

- 2G. Describe as specifically as possible the condition/integrity of each source (e.g., Do landfills have liners or caps?).**

Each landfill is approximately 15-20 feet deep with 3-4 feet of cover, but only 1/2 of the total landfill area can be considered waste because of the trench design.[2]

- 2I. Describe the size, volume, capacity, and area of each source.**

The volume of waste in each landfill was calculated using the acreage x depth x 0.5 because the trench and fill method deposits wastes in only 1/2 of the landfill area.[2]

Current landfill (No. 1 on map) - 199,160 yd³

Closed landfill (No. 2 on map) - 331,940 yd³

Closed landfill (No. 3 on map) - 132,780 yd³

Closed landfill (No. 4 on map) - 66,388 yd³

Acreage for landfills was taken from the previous PA responses for Fort Pickett.[7]

- 3. GROUNDWATER PATHWAY INFORMATION (see Section 3 of the HRS Final Rule-December 1990 Federal Register)**

- 3A. Determine if the groundwater within a 4-mile radius of each source is used for any of the following purposes and locate the wells on a map. Each radius should begin at the center of each source if the source is small or at the outer edge if it is large. Provide the depth of each well.**

There are no public drinking water wells within 4 miles of Fort Pickett.[2] There are 2 private drinking water wells on Fort Pickett (see map, Reference 8). All residences within 4 miles of Fort Pickett not serviced by the Fort Pickett water supply system derive their potable water from private groundwater sources. Accordingly, all households in this category are locations of private drinking water wells.[2][9]

- 3A2. irrigation of commercial food or commercial forage crops (include acres)**

There are no such groundwater uses within 4 miles of Fort Pickett.[2]

- 3A3. commercial livestock watering**

There are a few livestock farms within 4 miles of Fort Pickett that water 20-30 livestock from groundwater wells. The small number of cattle on these farms does not constitute commercial livestock.[2]

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

3A4. commercial aquaculture

There are no such groundwater uses within 4 miles of Fort Pickett.[2]

3A5. water for major or designated recreational area, excluding drinking-water use

There are no such groundwater uses within 4 miles of Fort Pickett.[2]

3A6. standby wells used for drinking water at least once a year

There are no such groundwater uses within 4 miles of Fort Pickett.[2]

3C. Identify the nearest drinking water well within a 4-mile radius of each source.

Both of the groundwater drinking wells used by Fort Pickett are shown on the map as Item 16 (Reference 8). The closest one is approximately 2.3 miles from the center point of the study area.[2][7]

3D. Determine the population (including workers, students, and residents) drawing from each drinking water well within the following radii. Each radius should start at the center of each source if the source is small, or at the outer edge if it is large. Count population in overlapping areas only once.

3D1. 0 - 1/4 mile

There are no drinking water wells in this range.[2]

3D2. 1/4 - 1/2 mile

There are no drinking water wells in this range.[2]

3D3. 1/2 - 1 mile

There are no drinking water wells in this range.[2]

3D4. 1 - 2 mile

This population can be determined using a house count of all houses not served by the Fort Pickett Water System that are outside of the Fort Pickett boundary but within the stated range.[8] The average population for each household in this county is 3.5 persons.[9]

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

3D5. 2 - 3 mile

This population can be determined using a house count of all houses not served by the Fort Pickett Water System that are outside of the Fort Pickett boundary but within the stated range.[8] The population for the building on Fort Pickett that is served by a private groundwater well (4) must also be added to the total population.[2] The average population for each household in this county is 3.5 persons.[9]

3D6. 3 - 4 mile

This population can be determined using a house count of all houses not served by the Fort Pickett Water System that are outside of the Fort Pickett boundary but within the stated range.[8] The population for the other well on Fort Pickett within this range and served by a private groundwater well (4) must also be added to the total population.[2] The average population for each household in this county is 3.5 persons.[9]

3F. Describe as specifically as possible the geology and hydrogeology of the facility area (including geological formation name, thickness, types of material, hydraulic conductivities, and depth to aquifers); provide references.

Fort Pickett is located in the Piedmont physiographic province, which consists of Precambrian gneiss, schist, and granite. The rock underlying the installation consists of Petersburg granite to the east and metamorphic gneiss and schist to the west. The surface of the rock is highly irregular due to intense weathering. Bedrock depth ranges from near surface in some outer areas to over 50 feet in other areas. Gravel, sand, silt, and clay cover the rock surface. The sediment cover is, for the most part, the end product of rock decomposition. In some areas a layer of saprolite (rock that has decomposed in place) exists between the rock and the sediment cover. The saprolite exists in various forms, ranging from rock fragments to clay, and is not always distinguishable from the sediment.[3] The depth to the aquifer of concern is approximately 20 ft. below grade.[10] The depths of private wells outside of Fort Pickett, and the wells on Fort Pickett are believed to be 30 ft. based on depths of monitoring wells on Fort Pickett.[2]

3G. Discuss any evidence of aquitards and discontinuities between aquifers within a 4-mile radius of each source.

The hydrogeology at Fort Pickett has been described as a multiaquifer system with producing zones separated both laterally and vertically by impermeable sediments or unfractured rock. This is evidence of discontinuities between aquifer and also indicates the presence of small "localized" aquitards.[11]

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

3H. Describe any evidence of interconnections between the uppermost aquifer and lower aquifers within 2 miles of each source.

The hydrogeology of Fort Pickett is such that groundwater is produced from three major sources:

1. Permeable zones of sand or gravel within the sediments;
2. Broken rock, gravel or sand within the saprolite zone; or
3. Fractures within the rock.

This coupled with analysis of a generalized geologic column for the Fort Pickett area indicates that there are interconnections between the uppermost aquifer and lower aquifers.[11]

3L. Provide results from groundwater sampling of aquifers underlying the sources and from domestic wells (drinking water) within 2 miles of each source.

Results of groundwater sampling of aquifers underlying the sources have already been discussed in deficiency response number 1D. Additional samples were collected from the groundwater monitor wells surrounding the Fire Training Area in Nov. 1989 (labelled # 15 on map, Reference 8). These samples were analyzed for total metals, VOC's and PHC's. Barium (0.0811 to 0.152 mg/L), Chromium (0.0088 to 0.0126 mg/L), and Lead (0.0503 to 0.119 mg/L) were the only contaminants found above detection limits. Monitor well locations, boring logs, analytical results and a summary are provided in Reference 11. The most recent sampling of these wells was conducted in Oct. 1990. In this effort, groundwater was sampled for total metals. Arsenic (<0.004 mg/L), Barium (0.083 to 3.21 mg/L), Cadmium (0.0009 to 0.0037 mg/L), Chromium (<0.0005 to 0.0026 mg/L) and Lead (0.001 to 0.002 mg/L) were detected in these groundwater samples. Results from this sampling effort were similar to the previous results but showed much lower lead levels. Sampling results are shown in Reference 12. Groundwater sampling data for domestic wells within 2 miles of Fort Pickett is not available.[2]

3M. Provide results from background groundwater sampling of aquifers underlying the sources.

MW-1 was used during the site characterization of the Fire Training Area (No. 15 on map). It is hydrologically upgradient from any potential source on Fort Pickett, and as such is indicative of background.[2] Sampling results and a summary are attached.[11]

HRS SCORING DEFICIENCY RESPONSES

ORIGINAL
(Reg)

Facility Name Fort Pickett

- 3N. Determine if any areas within a 4-mile radius of each source are located in a Wellhead Protection Area according to Section 1428 of the Safe Drinking Water Act.**

There are no Wellhead Protection Areas according to Section 1428 of the Safe Drinking Water Act within a 4-mile radius of Fort Pickett.[13][14]

- 4. SURFACE-WATER PATHWAY INFORMATION (see Section 4 of the HRS Final Rule - December 1990 Federal Register)**

- 4D. Identify if surface water drawn from intakes within 15 miles downstream of the probable point of entry is used for any of the following purposes:**

- 4D1. irrigation (5-acre minimum) of commercial food or commercial forage crops**

Water on this portion is used for irrigation of tobacco.[15]

- 4D2. watering of commercial livestock**

Water is not used for this purpose on this stretch of surface water.[15]

- 4D3. ingredient in commercial food preparation**

Water is not used for this purpose on this stretch of surface water.[15]

- 4D4. major or designated water recreation area, excluding drinking water**

Water is not used for this purpose on this stretch of surface water.[15]

- 4E. Identify the following targets associated with surface-water bodies 0 to 15 miles downstream of the probable point of entry**

- 4E1. population (residents, workers, and students)served by intakes of drinking water**

There are no drinking water intakes 0-15 miles downstream of Fort Pickett.[16]

- 4E2. sensitive environments (see Table 4-23, December 1990 Federal Register) and critical habitats for federally endangered or threatened species**

A habitat used by the Roanoke Log Perch, a federally endangered species, encompasses the Nottoway River and several tributaries (Stony Creek, Butterwood Creek and Sappony Creek) within 15 miles downstream of Fort Pickett.[17]

HRS SCORING DEFICIENCY RESPONSES

ORIGINAL
(Red)

Facility Name Fort Pickett

4E3. economically important resources (e.g., shellfish)

There are no economically important resources along this section of the Nottoway River.[17]

4E4. any portion of the surface water designated by a state for drinking-water use under Section 305(a) of the Clean Water Act; or any portion of surface water usable for drinking water

This section of the Nottoway River is useable for drinking water.[17]

4F. Determine the miles of wetlands (wetland frontage) along surface-water bodies 0 to 15 miles downstream from the probable point of entry (see 40 CFR section 230.3).

The miles of wetlands frontage along the Nottoway River 0-15 miles downstream from the probable point of entry from Fort Pickett is estimated to be 10 miles.[18]

4G. Provide results from sampling of wetlands and/or sensitive environments 0 to 15 miles downstream of each source.

Sampling results of wetlands and/or sensitive environments 0-15 miles downstream have not been located and are believed not to exist for the area of concern.[13]

4H. Discuss any qualitative, quantitative, or circumstantial evidence of contamination of surface waters from sources.

There is no evidence of contamination of surface waters from sources.[2]

4I. Provide results from sediment and surface-water sampling for points 0 to 15 miles downstream of each source.

There has been limited surface water sampling 0-15 miles downstream from Fort Pickett. Surface water and sediment (annotated by *) samples have been analyzed for an assortment of chemicals.[19]

4J. Provide results from background sediment and surface-water sampling.

Sampling results from points upstream are indicative of background levels with respect to Fort Pickett and any impact it may have on surface water quality. Background sampling includes sampling of surface water from the Fort Pickett municipal water system intake on the Nottoway Reservoir for trihalomethanes, volatile organics, inorganics, metals and pesticides. This intake is not downstream from any sources on Fort Pickett. The results are attached.[20]

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

- 4K. Provide results from sampling of surface-water intakes 0 to 15 miles downstream of each source.**

There are no surface water intakes 0-15 miles downstream from any source on Fort Pickett.[2][16]

- 4N. Discuss the average annual streamflow associated with each surface-water body located 0 to 15 miles downstream of each source.**

The average annual stream flow (in cubic feet/second) associated with the surface water bodies 0-15 miles downstream of Fort Pickett are contained in the EPA's PATHSCAN database.[16]

- 4P. Determine if sources are located in a 1-year, 10-year, 100-year, or 500-year flood plain.**

There are not any sources believed to be located in any floodplain.[2]

- 4Q. Discuss fisheries (recreational or commercial) in surfacewater bodies 0 to 15 miles downstream of each source:**

Recreational fishing occurs in the 550 or so acres of surface water bodies on Fort Pickett. It also occurs within this range on the Nottoway River.[17,18]

- 4Q1. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of streams and rivers 0 to 15 miles downstream of each source.**

This information is not available.[2][17]

- 4Q2. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of ponds, lakes, bays, or oceans 0 to 15 miles downstream of each source.**

This information is not available.[2][17]

- 4R. Identify closed fisheries 0 to 15 miles downstream of each source.**

There are no closed fisheries on this section of the Nottoway River.[17]

- 4S. Provide results from sampling of human food chain organism tissues in streams and rivers 0 to 15 miles downstream of each source and in ponds, lakes, and bays that receive drainage from the sources.**

Human food chain organism tissue samples have not been analyzed for this region of the Nottoway River.[19]

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

5. AIR PATHWAY INFORMATION (see Section 6 of the HRS Final Rule - December 1990 Federal Register)

5C. Determine if any of the following resources are located within a 1/2-mile radius of each source.

5C1. commercial agriculture

There is no commercial agriculture within 1/2 mile of any sources on Fort Pickett.[2]

5C2. commercial silviculture

Commercial silviculture occurs on the northern and eastern sections of Fort Pickett, but none is believed to occur within 1/2 mile of any sources on Fort Pickett.[2]

5C3. major or designated recreation area

There are no major or designated recreation areas within 1/2 mile of any sources on Fort Pickett.[2]

5D. Determine if sensitive environments are within a 4-mile radius of each source.

A habitat used by the Roanoke Log Perch, a federally endangered species, encompasses the Nottoway River which is within 4 miles of several sources on Fort Pickett.[17] There are also numerous wetlands on Fort Pickett within 4 miles of sources.[8][18]

5E. Determine the total area of wetlands within a 4-mile radius of each source.

The total area of wetlands within a 4 mile radius of potential sources on Fort Pickett is estimated to be 250 acres.[8][18]

6. SOIL-EXPOSURE PATHWAY INFORMATION (see Section 5 of the HRS Final Rule - December 1990 Federal Register)

6B. Provide locations and depths of soil samples and results.

The following soil sampling efforts have been conducted at Fort Pickett:

1. PCB sampling at Buildings 4072 and 1082. Results are attached.[4][5][6]
2. TPH sampling associated with UST removals at Stations 776, 1400 and 1558. Stations 776 and 1400 had results which were below the action level of 100 ppm TPH. The Station 1558 site has been characterized. Sampling results are

HRS SCORING DEFICIENCY RESPONSES

Facility Name Fort Pickett

attached.[22][23]

3. The Fire Training Area has been studied under a Preliminary Assessment/Site Investigation (PA/SI). Soil sampling results are attached.[24]

6C. Provide results of background soil sampling.

Under the Fire Training Area PA/SI, Soil Boring No. 5 (SB-5) is considered a background soil sample. Sampling results are attached.[24]

6E. Determine if any of the following are located near or within an area of soil contamination (within 2 feet of the surface); provide the number of individuals for 6E1 and 6E2:

Station 1558 is the only source on Fort Pickett which may have shallow soil contamination. It is not believed that any contamination is present within 2 ft. of the surface. This deficiency will be addressed in the event the current closure of this area turns up data indicating the presence of soil contamination.[2]

6E1. within 200 feet of any residences, schools, or day care centers and within the property boundary

This area is not within 200 ft. of any residences, schools, day care centers or the property boundary.[2]

6E2. within 200 feet of the work place area and within a work place property boundary

This area is within 150 ft. from Building 1556 which is a motor repair shop and has a worker population of 8.[2]

6E3. within boundaries of commercial agriculture, silviculture, livestock production, or grazing area

This area does not lie within any of the above boundaries.[2]

6E4. within boundaries of a terrestrial-sensitive environment (see Table 5-5, December 1990 Federal Register)

This area does not lie within boundaries of a terrestrial-sensitive environment.[2]

HRS SCORING DEFICIENCY RESPONSES

CHS
1/1/11

Facility Name Fort Pickett

6F. Determine the number of individuals who live, work, or attend school within the following distances of soil contamination (within 2 feet of the surface).

6F1. 0 - 1/4 mile radius

Estimated at 400 (peak).[2]

6F2. 1/4 - 1/2 mile radius

Estimated at 1,500 (peak).[2]

6F3. 1/2 - 1 mile radius

Estimated at 1,200 (peak).[2]

LIST OF REFERENCES

1. Quarterly Groundwater Monitoring Results for the Active Landfill at Fort Pickett, Aug. 1991.
- *2. Site interview with Mr. David Foley, Fort Pickett Environmental Coordinator, 19 November, 1991. (Interview not transcribed)
3. Geohydrologic Study No. 38-26-0569-86, Fort Pickett, Blackstone, VA, USAEHA, May, 1985.
4. Installation Assessment of the U.S. Army Garrison, Fort Pickett, Blackstone, VA., Report No. 316B, April, 1982. Prepared for U.S. Army Toxic and Hazardous Materials Agency. Prepared by Environmental Science and Engineering, Inc.
5. Special Investigation No. 20-44-0892-82, Analysis of Soil Samples from a Transformer Spill for Polychlorinated Biphenyls (PCB's), Fort Pickett, VA, 10 Nov., 1991.
6. Pesticide Special Investigation No. 20-44-0956-82, Analysis of Soil Samples for Polychlorinated Biphenyls (PCB's), Fort Pickett, Virginia, 16 June, 1982.
- *7. Preliminary Assessment Responses for Fort Pickett, Blackstone, VA., November, 1990. Prepared for U.S. Army Toxic and Hazardous Materials Agency. Prepared by Advanced Sciences, Inc.
8. USGS 7.5 minute quadrangles; Blackstone West, Blackstone East and Darvills.
9. Wellfax database from the National Water Well Association, based on 1980 census data, Dec. 1991.
10. Site Characterization, Fort Pickett, Station 1558, Fort Pickett, VA, August 1991. Prepared by Belpar Environmental, Inc., and UPS Consultants.
11. Preliminary Assessment/Site Investigation, Fire Training Area, Fort Pickett, VA., May 1990. Prepared by Hunter/ESE.
12. Groundwater sampling results from the Fire Training Area, Environmental Laboratories, Inc., October, 1990.
13. Telephone conversation with Mr. Byron Prugh, USGS Water Resources, 12 December, 1991.
14. Phone conversation with Mr. Terry Wagner, Virginia State Water Control Board, 16 December 1991.
15. Letter from Mr. Paul Herman, Virginia State Water Control Board, 27 January 1992.
16. EPA, WQAB, PATHSCAN Database, December 1991.
17. Telephone conversation with Mr. Bill Kittrell, Nottoway County Biologist, 12 December 1991.

- *18. U.S. Department of the Interior, Fish and Wildlife Service, National Wetland Inventory Maps, Blackstone East, Blackstone West, Darrills, Danielstown, Warfield and McKenney, VA, 7.5 minute quadrangles.
19. U.S. Environmental Protection Agency (EPA) Storage and Retrieval (STORET) Water Quality Data (Surface Water), December 1991.
20. Surface water sampling results from the Fort Pickett drinking water system intake on the Nottoway River, 1991.
21. Installation Assessment of the U.S. Army Garrison, Fort Pickett, Blackstone, VA., Report No. 316B, April, 1982. Prepared for U.S. Army Toxic and Hazardous Materials Agency. Prepared by Environmental Science and Engineering, Inc.
22. Memorandums for Record, Mr. David Foley, 11 and 20 December, 1990.
23. Site characterization, Fort Pickett, Station 1558, Fort Pickett, VA, August 1991. Prepared by Belpar Environmental, Inc., and UPS Consultants.
24. Preliminary Assessment/Site Investigation, Fire Training Area, Fort Pickett, VA., May 1990. Prepared by Hunter/ESE.

* References previously provided or not available.

REFERENCE 1



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

PAGE 1
CF: SWC
Waste M

Data for Quarterly monitoring
for active landfill at
Fort Bragg

INVOICE #: 17863
WORK ORDER #: 27646
PO #: DAKF40-90-W-8436

BILL: FINANCE AND ACCOUNTING
BUILDING 2-1120
FORT BRAGG, NC 28307

CUSTOMER #: 1103
CONTRACT #: 90/468
SAMPLE RCVD: 08/29/91
DUE DATE: / /

ANALYSIS REPORT

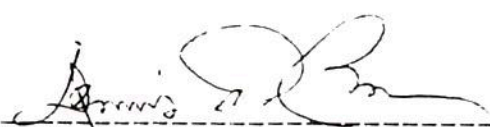
COMMENTS: AMMONIA, NITRITE AND NITRATE RESULTS EXPRESSED AS N
LOCATION: FORT PICKETT LNOFL

#	COMPONENT	RESULTS	UNITS
79982	SAMPLE DATE: 08/28/91 SAMPLE SOURCE: MW #1		
79982	PH	5.7	BU @ 21 C
9982	ALKALINITY	31	MG/L
9982	SOLIDS	351	MG/L
79982	T VOLATILE SOLID	41	MG/L
79982	T FIXED SOLIDS	310	MG/L
9982	TSUSPENDED SOLID	68	MG/L
79982	TVSS	31	MG/L
79982	TFIXED SVS SOLID	37	MG/L
9982	FLUORIDE	0.03	MG/L
79982	CHLORIDE	1.9	MG/L
79982	HARDNESS	26	MG/L
9982	SULFATE	1.2	MG/L
9982	NITRITE	< 0.03	MG/L
982	NITRATE	0.19	MG/L
9982	TOC	6.1	MG/L
9982	TKN	0.2	MG/L
79982	AMMONIA	0.04	MG/L

REVIEWED BY:

REPORTED BY:

REPORT DATE:
VA LAB ID # - 00115


DENNIS T. BROWN /LAB MANAGER
ENVIRONMENTAL SYSTEMS SERVICE, LTD.
P. O. BOX 520
CULPEPER, VIRGINIA 22701
09/26/91



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

INVOICE #: 17864

WORK ORDER #: 27657

PO #: DAKF40-90-W-8436

BILL: FINANCE AND ACCOUNTING
BUILDING 2-1120
FORT BRAGG, NC 28307

CUSTOMER #: 1103
CONTRACT #: 90/468
SAMPLE RCVD: 08/29/91
DUE DATE: / /

ANALYSIS REPORT

COMMENTS: AMMONIA, NITRITE AND NITRATE RESULTS EXPRESSED AS N

LOCATION: FORT PICKETT LNOFL

#	COMPONENT	RESULTS	UNITS
79983	SAMPLE DATE: 08/28/91 SAMPLE SOURCE: MW #2		
79983	PHOSPHORUS	0.32	MG/L
9983	TOTAL COLIFORM	23	CFU/100 ML
9983	FECAL COLIFORM	23	CFU/100 ML
79983	POTASSIUM	0.38	MG/L
9983	ARSENIC	0.001	MG/L
9983	CADMIUM	0.001	MG/L
79983	CALCIUM	0.55	MG/L
79983	CHROMIUM	0.001	MG/L
9983	COPPER	0.01	MG/L
79983	IRON	0.11	MG/L
79983	LEAD	0.001	MG/L
9983	MAGNESIUM	0.58	MG/L
9983	MANGANESE	0.01	MG/L
9983	MERCURY	0.001	MG/L
9983	ZINC	0.03	MG/L
9983	SODIUM	3.56	MG/L

REVIEWED BY:

REPORTED BY:

REPORT DATE:

VA LAB ID # - 00115

Dennis T. Brown
DENNIS T. BROWN / LAB MANAGER
ENVIRONMENTAL SYSTEMS SERVICE, LTD.
P. O. BOX 520
CUPEPER, VIRGINIA 22701
09/26/91



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

PAGE 1

Original

INVOICE #: 17865

WORK ORDER #: 28136
PO #: DAKF40-90-W-8435BILL: FINANCE AND ACCOUNTING
BUILDING 2-1120
FORT BRAGG, NC 28307CUSTOMER #: 1103
CONTRACT #: 90/4678
SAMPLE RCVD: 09/18/91
DUE DATE: / /

ANALYSIS REPORT

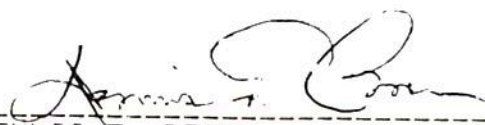
COMMENTS:

LOCATION: FORT PICKETT STP

T #	COMPONENT	RESULTS	UNITS
00375	SAMPLE DATE: 09/17/91	SAMPLE SOURCE: WASTE WATER	
00375	ACTIVE COPPER	0.03	MG/L
0375	ACTIVE LEAD	0.003	MG/L
0375	TOT REC ZINC	0.11	MG/L

REVIEWED BY:

REPORTED BY:

REPORT DATE:
VA LAB ID # - 00115
DENNIS T. BROWN /LAB MANAGER
ENVIRONMENTAL SYSTEMS SERVICE, LTD
P. O. BOX 520
CULPEPER, VIRGINIA 22701
09/26/91



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

INVOICE #: 17864

WORK ORDER #: 27657

PO #: DAKF40-90-W-8436

LL: FINANCE AND ACCOUNTING
BUILDING 2-1120
FORT BRAGG, NC 28307

CUSTOMER #: 1103
CONTRACT #: 90/468
SAMPLE RCVD: 08/29/91
DUE DATE: / /

ANALYSIS REPORT

COMMENTS: AMMONIA, NITRITE AND NITRATE RESULTS EXPRESSED AS N

LOCATION: FORT PICKETT LNOFL


#	COMPONENT	RESULTS	UNITS
79983	SAMPLE DATE: 08/28/91	SAMPLE SOURCE: MW #2	
79983	PH	5.9	BU @ 21 C
983	ALKALINITY	4	MG/L
983	SOLIDS	261	MG/L
79983	T VOLATILE SOLID	20	MG/L
983	T FIXED SOLIDS	241	MG/L
983	TSUSPENDED SOLID	102	MG/L
79983	TVSS	3	MG/L
79983	TFIXED SUS SOLID	99	MG/L
983	FLUORIDE	0.02	MG/L
79983	CHLORIDE	2.5	MG/L
79983	HARDNESS	8	MG/L
983	SULFATE	9.5	MG/L
983	NITRITE	< 0.03	MG/L
983	NITRATE	< 0.03	MG/L
983	TOC	6.6	MG/L
983	TKN	0.1	MG/L
79983	AMMONIA	0.01	MG/L

REVIEWED BY:

REPORTED BY:

REPORT DATE:

VA LAB ID # - 00115


DENNIS T. BROWN /LAB MANAGER
ENVIRONMENTAL SYSTEMS SERVICE, LTD.
P. O. BOX 520
CULPEPER, VIRGINIA 22701
09/26/91



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

INVOICE #: 17863

WORK ORDER #: 27646
PO #: DAKF40-90-W-8436LL: FINANCE AND ACCOUNTING
BUILDING 2-1120
FORT BRAGG, NC 28307CUSTOMER #: 1103
CONTRACT #: 90/468
SAMPLE RCVD: 08/29/91
DUE DATE: / /

ANALYSIS REPORT

COMMENTS: AMMONIA, NITRITE AND NITRATE RESULTS EXPRESSED AS N

LOCATION: FORT PICKETT LNDFL

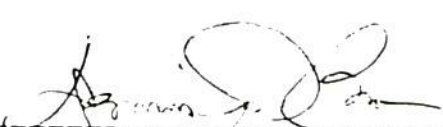
TA #	COMPONENT	RESULTS	UNITS
79982	SAMPLE DATE: 08/28/91	SAMPLE SOURCE: MW #1	
79982	PHOSPHORUS	0.28	MG/L
79982	TOTAL COLIFORM	23	CFU/100 ML
79982	FECAL COLIFORM	23	CFU/100 ML
79982	POTASSIUM	1.63	MG/L
79982	ARSENIC	< 0.001	MG/L
79982	CADMIUM	< 0.001	MG/L
79982	CALCIUM	2.16	MG/L
79982	CHROMIUM	0.003	MG/L
79982	COPPER	< 0.01	MG/L
79982	IRON	0.03	MG/L
79982	LEAD	0.001	MG/L
79982	MAGNESIUM	1.20	MG/L
79982	MANGANESE	< 0.01	MG/L
79982	MERCURY	< 0.001	MG/L
79982	ZINC	0.01	MG/L
79982	SODIUM	5.56	MG/L

REVIEWED BY:

REPORTED BY:

REPORT DATE:

VA LAB ID # - 00115


DENNIS T. BROWN /LAB MANAGER
ENVIRONMENTAL SYSTEMS SERVICE, LTD.
P. O. BOX 520
CULPEPER, VIRGINIA 22701
09/26/91

REFERENCE 3



4

**UNITED STATES ARMY
ENVIRONMENTAL HYGIENE
AGENCY**

ABERDEEN PROVING GROUND, MD 21010-5422

GEOHYDROLOGIC STUDY NO. 38-26-0569-86
FORT PICKETT
BLACKSTONE, VIRGINIA
15-21 MAY 1985

Distribution limited to US Government agencies only;
protection of privileged information evaluating another
command; Nov 85. Requests for this document must be
referred to Commander, US Army Training and Doctrine
Command, ATTN: ATMD, Fort Monroe, VA 23651-5000.



DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO
ATTENTION OF

HSHB-ES-G

GEOHYDROLOGIC STUDY NO. 38-26-0569-86
FORT PICKETT
BLACKSTONE, VIRGINIA
15-21 MAY 1985

1. **AUTHORITY.** Letter, HQ TRADOC, ATEN-FN, 1 February 1985, subject: Request for Groundwater Consultation with Fort Gordon, and Geohydrologic Study of Fort Pickett Inactive Landfill.

2. **REFERENCES.** See Appendix A for a listing of references.

3. **PURPOSE.** To determine the impact of a closed landfill on the local ground-water quality by installing monitoring wells around the site and analyzing the ground water.

4. **GENERAL.**

a. Personnel Contacted.

(1) The installation personnel contacted during this study are listed in Appendix B.

(2) In addition to the logistical and manpower support provided by Fort Pickett personnel, a well drilling team from the 319th Engineering Company, US Army Reserves, commanded by CPT William H. Smith, provided labor support for a portion of the study. This was arranged to provide actual drilling experience for the team in conjunction with its 2-week annual training.

b. Mission. Fort Pickett is a semiactive subinstallation of the US Army Quartermaster Center and Fort Lee, under the command of TRADOC. The primary mission of Fort Pickett is to provide administrative and logistical support and maneuver and training areas (including live-fire tank and artillery ranges) for Reserve components, units of the Active Army, and other military services.

c. Location and Size. Fort Pickett is located approximately 3 miles east of the town of Blackstone, Virginia (see Figure 1). The installation encompasses 45,199 acres in areas of Nottoway, Brunswick, Dinwiddie, and Lenoir Counties.

Use of trademarked names does not imply endorsement by the US Army, but is intended only to assist in identification of a specific product.

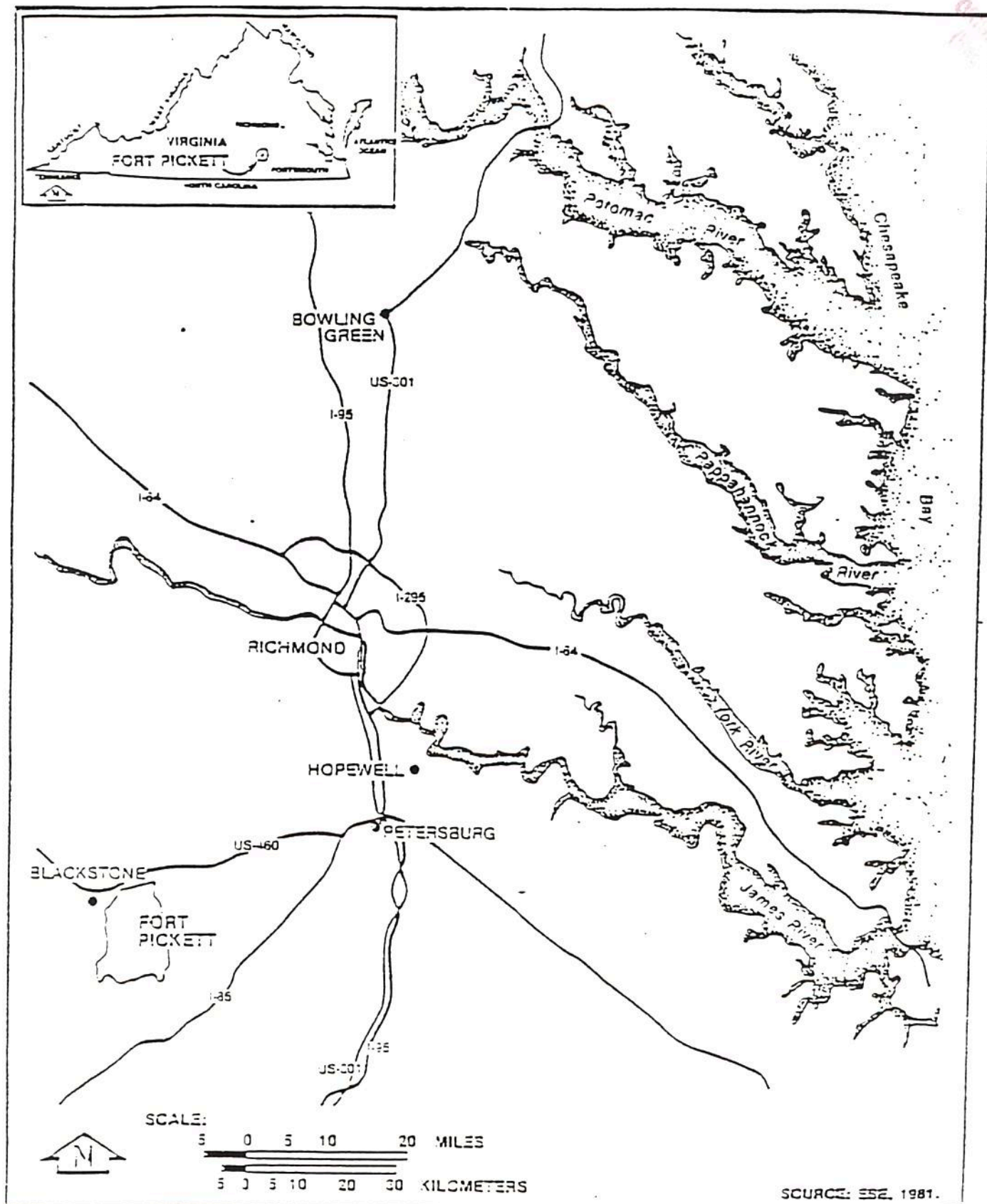


FIGURE 1. Location Map, Fort Pickett, Virginia

Original
Recd

d. Geology. Fort Pickett is located in the Piedmont physiographic province, which consists of Precambrian gneiss, schist, and granite. The rock underlying the installation consists of Petersburg granite to the east and metamorphic gneiss and schist to the west. The surface of the rock is highly irregular due to intense weathering. Bedrock depth ranges from near surface in some outer areas to over 50 feet in other areas. Gravel, sand, silt, and clay cover the rock surface. The sediment cover is, for the most part, the end product of rock decomposition. In some areas a layer of saprolite (rock that has decomposed in place) exists between the rock and the sediment cover. The saprolite exists in various forms, ranging from rock fragments to clay, and is not always distinguishable from the sediment.

e. Regional Ground Water. The ground-water system at Fort Pickett probably exists as a multiaquifer system, with aquifers existing in the sand, gravel, saprolite, or rock fractures. The aquifers are separated both laterally and vertically by impermeable sediments or unfractured rock. The original rock texture is generally impermeable. The general direction of ground-water flow is towards low areas, where it discharges to the many onpost streams. Regional recharge is the direct result of rainfall at the site.

f. Local Ground Water. The ground water beneath the inactive sanitary landfill was anticipated to flow toward a small surface stream approximately 1,000 feet to the north of the site. The nearest use of untreated ground water was a potable well located 3 miles west of the site. Therefore, there is no chance that leachate from this landfill would contaminate a water supply well.

g. Background. This Agency has been requested by TRADOC to study the quality of ground water beneath inactive and/or closed sanitary landfill sites at various TRADOC installations. In the past some of these landfills were the disposal sites for variable quantities of waste oils, pesticides, and herbicides. This report is the result of a study at the Fort Pickett inactive sanitary landfill, which is known to be the burial location of waste herbicides, including 2,4-D and 2,4,5-T. This landfill opened in the early 1960's and closed in 1982. During this study a drilling team from this Agency installed five monitoring wells around the site and sampled the wells for a wide range of contaminants.

h. Ground-water Standards.

(1) The quality of ground water beneath the inactive sanitary landfill was compared to ground-water standards for the Commonwealth of Virginia, whenever applicable (reference 5). For many of the parameters, the values are identical to the National Interim Primary Drinking Water Regulation (NIPDWR) standards (reference 1), or the National Secondary Drinking Water Regulation (NSDWR) criteria (reference 2). For some of the ground-water parameters, however, the State standards are below the detectable limits of current technology. The standards were adopted as part of the State's antidegradation policy for ground water. The

ORIGINAL
(Red)

antidegradation policy states that the natural quality of the State's ground water will be maintained. In addition, if any substance is found in the ground water at levels above its natural concentration, no addition to that concentration shall be made. The result of this policy was to set the accepted level of some toxic metals and organics so low that any detectable quantity could be challenged by a State Citizens Board. Those parameters for which the State ground-water standards are below detectable limits are footnoted in the Tables in Appendix C.

(2) The Virginia ground-water standards and NIPDWR standards primarily list the toxic metals, pesticides, herbicides, and other substances which are considered a definite risk to human health. For those parameters which had no State ground-water standards, the Virginia Surface Water Standards for Public Surface Water Supplies (reference 5) were used. Those parameters were also compared to NIPDWR standards or NSDWR criteria and footnoted in the tables in Appendix C.

(3) The ground-water and drinking-water standards have not been determined for many organic compounds, including the purgeable organic compounds. Therefore, the levels of these contaminants were compared to the US Environmental Protection Agency (EPA) criteria for increased cancer risk (reference 4). These criteria are an estimate of the contaminant concentrations in water which may result in one additional cancer risk per 100,000 people, assuming continual daily consumption of the water.

5. FINDINGS AND DISCUSSION.

a. Well Locations. Five monitoring wells were installed around the inactive sanitary landfill to a depth of 35 to 43 feet. See Figure 2 for the location of the wells. Four of the wells were located to the north and west of the landfill in the probable direction of ground-water flow. The remaining well, Well No. OLF1, was placed in the southeast corner of the landfill to act as a background well.

b. Well Construction. See Appendix D for the method used to construct the monitoring wells.

c. Ground-water Depth. Ground water at this site was first encountered at depths of 24 to 34 feet (see Appendix E). The water levels were again measured after 24 hours and recorded in Table C-10. The ground elevations were later surveyed to confirm the direction of ground-water flow. Mapped ground-water elevation contours on Figure 2 show that ground water flows to the north at this site.

d. Soils. The major constituent of the soils beneath the inactive landfill consisted of a dense silt (see Appendix E). The remaining fractions of the soils, however, ranged from clay to 1/4-inch-diameter gravel. These soils were found at various depths in the different borings, indicating a very irregular soil profile.

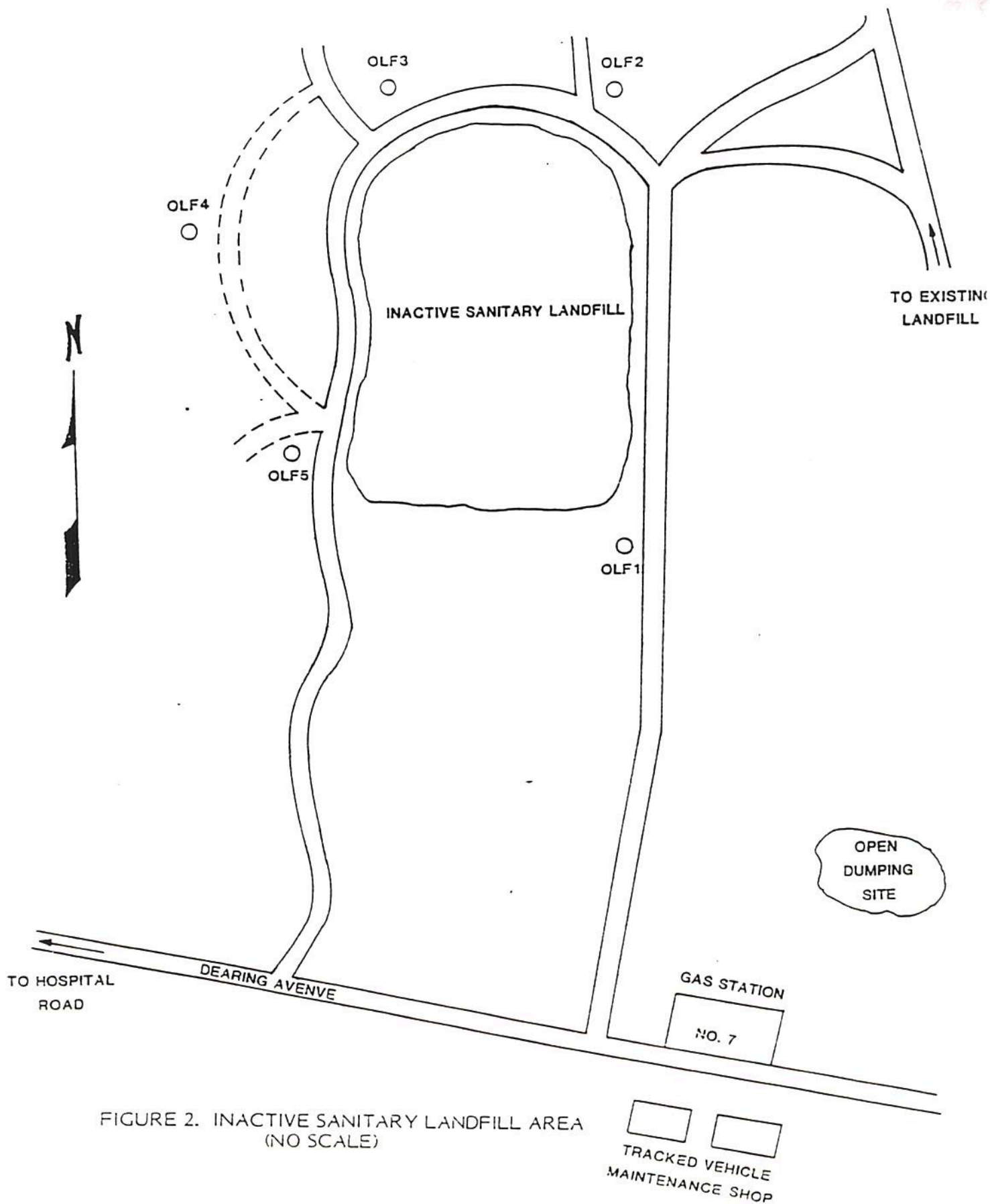


FIGURE 2. INACTIVE SANITARY LANDFILL AREA
(NO SCALE)

e. Sampling Procedures and Preparation. See Appendix F for ground-water sampling procedures and preparation methods.

f. Sample Analyses. The methods used to analyze the samples are given in Appendix G.

g. Laboratory Results.

(1) Acid Extractable and Base-Neutral Extractable Organic Compound Analyses (Tables C-1 and C-2). There were no detectable levels of acid extractable or base-neutral organics found at this site.

(2) Explosives Analyses (Table C-3). There were no detectable levels of explosives found at this site.

(3) Pesticides and Polychlorinated Biphenyl (PCB) Analysis (Table C-4). Well OLF3 contained 0.05 $\mu\text{g/L}$ of lindane, which is above the State level of 0.01 $\mu\text{g/L}$ for ground water, but below the NIPDWR standard of 4 $\mu\text{g/L}$ (see paragraph 5h). No other pesticides or PCBs were detected.

(4) Herbicides Analysis (Table C-5). Well OLF3 contained 29 $\mu\text{g/L}$ of 2,4-D and trace levels of 2,4,5-T. The level for 2,4-D was below both the Virginia ground-water and NIPDWR standards. There is no listed State or Federal standard for 2,4,5-T; however, the State ground-water and NIPDWR standard for silvex (2,4,5-TP) is 10 $\mu\text{g/L}$. Since these chemicals are similar in nature, it is anticipated that a standard of 10 $\mu\text{g/L}$ for 2,4,5-T may exist in the future. The trace amount of 2,4,5-T found during this sampling was below the 0.5 $\mu\text{g/L}$ detection limit, so the actual level was well below any expected future standard. No other herbicides were detected.

(5) Purgeable Organics Analysis (Table C-6).

(a) Four purgeable organic compounds were discovered in the ground water around the landfill. Most of these were found in the upgradient well, OLF1. The levels of the detected compounds ranged from 4 $\mu\text{g/L}$ to 28 $\mu\text{g/L}$. Since there are no ground-water or drinking-water standards for these compounds, the levels were compared to the EPA criteria for increased cancer risk of one per 100,000 people [see paragraph 4h(3), this report]. The levels of three of the compounds were above this risk level. There is no published carcinogenic risk level for 1,1-dichloroethane. As mentioned in paragraph 4h(3), these risk levels assume continual daily consumption of the water. Since this landfill is 3 miles from any untreated drinking source, this contamination is not a health risk.

(b) The majority of purgeable organics detected at this site were found in the upgradient well, OLF1, indicating that these compounds may have been disposed of farther south of this landfill. Well OLF1 is located approximately 1,000 feet north of a small gasoline station used to fill tracked vehicles. In addition, a large tracked-vehicle maintenance shop is

located across the street (see Figure 2). Either of these locations could be a source of purgeable organics entering the soil or ground water. Further steps should be taken to identify the source(s) of this contamination. These steps may include testing any underground storage tanks at both locations, installing additional monitoring wells, and/or determining any past spills upgradient of well OLF1.

(6) Additional Organic Compound Analysis (Table C-7). Six additional organic compounds were tentatively identified in both the upgradient and downgradient wells. Four of these compounds contained iodine, two of which could be identified only by their molecular weight. There are currently no ground-water, drinking water, or toxicity standards for any of the six compounds.

(7) Metal Analysis (Table C-8).

(a) The Virginia ground-water standards were slightly exceeded for cadmium and mercury; however, these standards were also below the available detection limit (see paragraph 5h). The levels of these metals were below the NIPDWR standards.

(b) The levels of manganese were all above the State surface water and NSDWR criteria. These criteria, however, are based on the aesthetic quality of the water and not on toxicity levels. Problems which are associated with manganese at these levels include black deposits left on sinks and stains on clothes washed in the water.

(8) Nonmetal Analysis (Table C-9). Phenolics were found in all of the wells at levels above the Virginia ground-water and surface water standards. These standards, however, were below the detection limits (see paragraph 5h). The levels were all below the national drinking water criterion for phenols. Phenols are listed in a group of "Other Drinking Water Standards." There were no other nonmetals above the State's ground-water and surface-water standards, when applicable.

(9) Field Parameter Analysis (Table C-10). The field pH measured at the inactive landfill ranged from 5.1 to 5.8. The State ground-water standards for the Piedmont and Blue Ridge Physiographic Provinces is 5.5 to 8.5. Some of the ground-water samples at this site were below this level; however, this is probably naturally occurring and not the result of leachate production.

h. Parameters Exceeding State Standards. The levels of lindane, cadmium, mercury, and phenols which exceeded the State ground-water standards were all low enough to be well within the National drinking water standards or criteria. Since the State standards are below any reasonably obtainable detection limit for these as well as other parameters (see Tables C-4 and C-8), these standards should be updated to comply with current technology. Until then, the installation should petition the State to accept these concentrations based on levels below the national drinking water standards/criteria.

i. Future Sampling. Based on the results of data collected during this study, the sampling of these wells should be continued semiannually. The parameters to be analyzed are purgeable organic compounds, pesticides (including silvex; 2,4-D; and 2,4,5-T), metals, phenols, and field parameters (including water level and field pH). The semiannual sampling should take place in the spring and the fall, beginning in the spring of 1986 and continuing for a period of 5 years in order to determine any contamination trend (or lack thereof).

j. Solid Waste Disposal Procedures.

(1) In addition to installing and sampling the five monitoring wells, the study team had an opportunity to observe the condition of the inactive sanitary landfill area, as well as the condition and some operating procedures at the active sanitary landfill. Approximately 250 feet southeast of well OLF1, at the old landfill, was an open dumping site which contained pieces of rusted tank treads, tracked-vehicle sprockets, 20-pound fire extinguishers, and large gas cylinders. Instead of dumping or landfilling these items, they should be sent to the Defense Reutilization and Marketing Office (DRMO).

(2) At the existing sanitary landfill, the study team observed three pickup trucks dump into the landfill used barracks furniture which had been condemned by the DRMO. The usable furniture was then scavenged by Fort Pickett personnel, and the remainder was burned that day. (NOTE: Fort Pickett has a permit to burn combustible items.) Later discussions with Mr. Copeland, the Regional Reutilization and Marketing Officer at Richmond, indicated that this was the correct action due to the cost of moving the condemned furniture. Other items found in the existing sanitary landfill, such as metal tables and chairs, as well as other metal items found in the combustible materials area, should have been sent to the DRMO warehouse.

6. CONCLUSIONS.

a. Low levels of cadmium, mercury, lindane, and phenols were leaching into the ground water in quantities above the State ground-water standards, but well below the National drinking water standards or criteria.

b. A detectable amount of the herbicide 2,4-D was leaching into the ground water. However, the concentration was below both the State ground-water standard and National drinking water standard.

c. Low levels of purgeable organic compounds were entering the ground water from a source upgradient of the inactive sanitary landfill.

d. The ground water beneath the inactive landfill is not upgradient of any sources of untreated drinking water.

e. Metal items which should have gone to the DRMO warehouse at Fort Pickett had been placed near the inactive landfill and in the existing sanitary landfill.

7. RECOMMENDATIONS. The following recommendations are based on good environmental engineering practices.

a. Petition Virginia to accept the low levels of cadmium, mercury, lindane, and phenols based on quantities below National drinking water standards/criteria.

b. Continue to sample the installed wells semiannually for the parameters listed in paragraph 5i, this report.

c. Identify the source(s) of purgeable organic contamination to the ground water upgradient of the inactive sanitary landfill.

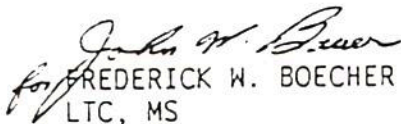
d. Review solid waste disposal practices to minimize dumping of metal items near or into the sanitary landfills.

8. TECHNICAL ASSISTANCE. Requests for services should be directed through appropriate command channels of the requesting activity to the Commander, US Army Environmental Hygiene Agency, ATTN: HSHB-ES, Aberdeen Proving Ground, MD 21010-5422, with an information copy furnished the Commander, US Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000.



DAVID A. SHEETS
CPT, MS
Sanitary Engineer
Waste Disposal Engineering Division

APPROVED:



FREDERICK W. BOECHER
LTC, MS

Chief, Waste Disposal Engineering Division

REFERENCE 4

Polychlorinated Biphenyls (PCBs)

Out-of-service transformers are being stored in the open on an unbermed concrete pad which was formerly the foundation of a heating plant near the old hospital area. At the time of the site visit, 67 transformers were stockpiled at this location. All but 21 have been analyzed for PCB content. Of those analyzed, 28 contained PCBs [>50 parts per million (ppm)] and 18 were classified as non-PCB (<50 ppm). Labels were affixed to all PCB-containing items. [Subsequent to the site visit, all transformers which had been determined to contain PCB-contaminated fluid were removed (Jan. 14, 1982) for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB-contaminated transformers is scheduled for completion during July 15 to Oct. 15, 1982.]

This storage location does not meet Federal requirements for a PCB storage facility (EPA, 1980f). A covered, bermed facility, which does meet Federal requirements, had recently been constructed at this location; however, the roof was designed too low to allow a forklift to enter the facility, and the transformers could not be placed inside. Many of the transformers showed evidence of leakage.

A recent PCB spill occurred when an in-service transformer overheated and exploded on a pole near Bldg. 1082. It was reported that approximately 40 to 60 liters (1) of PCB fluids spilled onto the ground and asphalt road at the base of the pole. At the time of site visit, visible stains were present on the ground in an area measuring approximately 1 m by 3 m. A soil sample was taken and analyzed by USAEHA, who reported 61 milligrams per kilogram (mg/kg) of PCBs in the sample (USAEHA, 1981c). FTP DFAE personnel have recently taken additional samples for analysis by USAEHA to delineate the extent of the contamination before proceeding with eventual cleanup. [Subsequent to the site visit, follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 cm of soil at three locations having greatest visible

11/24/82

ORIGINAL
(Rec)

evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 50 ppm. Additionally, the spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals.]

Another transformer fluid spill reportedly occurred about 3 years ago when someone shot a hole in a transformer on a pole near Bldg. 4072. The fluids (approximately 70 l) ran down the pole to the ground. No soil sampling or cleanup was conducted. [Subsequent to the site visit, soil samples were taken (May 28, 1982) at the base of the transformer pole at Bldg. 4072, and arrangements have been made for USAEHA to perform PCB analyses. On June 16, 1982, USAEHA reported that no PCBs were detected at a lower limit of detectability of 1 ppm.]

Chemicals

Various activities on FTP use chemicals in support of specific missions. These activities are: (1) the water test laboratories at the STP and WTP, (2) the photographic laboratory, (3) pest control services, (4) the health clinic, and (5) vehicle maintenance operations. The use and disposal of chemicals handled by each activity are discussed in Secs. 2.1.3 (Laboratory Operations), 2.1.6 (Pesticides), and 2.2.1 (Industrial Wastes). During the site visit, no incompatible chemical stocks were observed being stored together.

Agents (Chemical and Biological)

The search of records did not indicate that any lethal chemical or biological agents had been stored or used on FTP. Pyrotechnic rounds have been and are currently being used on FTP (see discussion in Sec. 2.1.6). Additionally, CS riot control agent is used for training activities. This is discussed in Sec. 2.1.5.

Radiological Materials

A soil moisture/density gauge (National Stock No. 6635-01-030-6896) is stored in Bldg. 765 of the ECS area. The building is kept locked, and

REFERENCE 5

Results of PCB analysis of
soil samples at transformer pole
near Building 1082.

ATEN-FN (3 Dec 81) 1st Ind

SUBJECT: Special Investigation No. 20-44-0892-82, Analysis of Soil Samples
from a Transformer Spill for Polychlorinated Biphenyls (PCBs),
Fort Pickett, Virginia, 10 November 1981


HQ TRADOC, Fort Monroe, VA 23651 07 JAN 1982

TO: Commander, Fort Pickett, Blackstone, VA 23824

1. Forwarded for information and action.
2. HQ TRADOC POC is LT Waligora, AUTOVON 680-2362.

FOR THE COMMANDER:

1 Incl
nc


DOREATHA MANGRUM
ASSISTANT ADJUTANT GENERAL



DEPARTMENT OF THE ARMY MS EHRHARDT/eoh/AUTOVON
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY 584-3613
ABERDEEN PROVING GROUND, MARYLAND 21010

ORIGINAL
(R)

3 DEC 1981

HSE-RP-MO

SUBJECT: Special Investigation No. 20-44-0892-82, Analysis of Soil Samples from a Transformer Spill for Polychlorinated Biphenyls (PCBs), Fort Pickett, Virginia, 10 November 1981

Commander
US Army Training and Doctrine Command
ATTN: ATMD
Fort Monroe, VA 23651

1. AUTHORITY. Optional Form 41, Fort Pickett, 8 October 1981, subject: Samples Which Require PCB Analysis.
2. REFERENCE. Title 40, Code of Federal Regulations (CFR), 1980 rev., Part 761, Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
3. PURPOSE. To determine the presence and extent of PCBs and to provide assistance as requested in the solution of any related technical or administrative problems.
4. FINDINGS. As requested in paragraph 1, results of electron-capture gas-liquid chromatographic and/or density analyses are inclosed. The PCBs analyzed for included Aroclor® 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1262.

®Aroclor is a registered trademark of Monsanto Company, 800 N. Lindbergh Blvd, St. Louis, MO 63166. Use of trademarked names does not imply endorsement by the US Army, but is intended only to assist in identification of a specific product

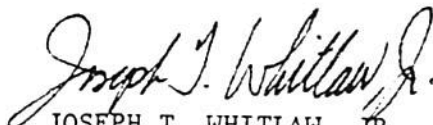
HSE-RP-MO

SUBJECT: Special Investigation No. 20-44-0892-82, Analysis of Soil Samples
from a Transformer Spill for Polychlorinated Biphenyls (PCBs),
Fort Pickett, Virginia, 10 November 1981

5. TECHNICAL ASSISTANCE. Further information relative to the PCB analysis
may be obtained by calling the Project Officer, Ms. Sandra Ehrhardt, AUTOVON
584-3613/4131.

FOR THE COMMANDER:

1 Incl
as


JOSEPH T. WHITLAW, JR.
COL, MSC
Director, Radiation and
Environmental Sciences

CF:
HQDA (DASG-PSP)
Cdr, HSC (HSPA-P)
Cdr, MEDDAC, Fort Lee (PVNTMED Actv)(2 cy)
C, USAEHA Rgn Div - North

HSE-RP-MO

SUBJECT: Special Investigation No. 20-44-0892-82, Analysis of Soil Samples
from a Transformer Spill for Polychlorinated Biphenyls (PCBs),
Fort Pickett, Virginia, 10 November 1981

TABLE. Results of Analysis.

<u>SAMPLE NO.</u>	<u>USAEHA NO.</u>	<u>PCB RESIDUE (ppm)</u>
N. Side of Transformer	Sp 5493	5.6
S. Side of Transformer	Sp 5494	12.9
E. Side of Transformer	Sp 5495	23.3



CHARLES A. MOORE

CPT, MSC

Chief, Pesticide Analysis Branch

Organic Environmental Chemistry Division

REFERENCE 6

Results of PCB Analyses
of Soil Samples at
Quarters 4072 (Transformer
pole)

ATEN-FN (24 Jun 82) 1st Ind

SUBJECT: Pesticide Special Investigation No. 20-44-0956-82, Analysis of Soil
Samples for Polychlorinated Biphenyls (PCBs), Fort Pickett, Virginia
16 June 1982

HQ TRADOC, Fort Monroe, VA 23651 30 JUL 1982

TO: Commander, Fort Pickett, Blackstone, VA 23624

1. Subject report forwarded for information and action.
2. HQ TRADOC guidance for turn-in of PCB items to DPDO is provided at inclosure 2.
3. HQ TRADOC POC is 1LT Waligora, AUTOVON 680-2362.

FOR THE COMMANDER:

2 Incl
Added 1 Incl
2. as


DOREATHA MANGRUM
ASSISTANT ADJUTANT GENERAL



DEPARTMENT OF THE ARMY MS EHRHARDT/eoh/AUTOVON
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY 584-3613
ABERDEEN PROVING GROUND, MARYLAND 21010

REPLY TO
ATTENTION OF

HSHB-RP-MO

24 JUN 1982

SUBJECT: Pesticide Special Investigation No. 20-44-0956-82, Analysis of Soil Samples for Polychlorinated Biphenyls (PCBs), Fort Pickett, Virginia
16 June 1982

Commander
US Army Training and Doctrine Command
ATTN: ATMD
Fort Monroe, VA 23651

1. AUTHORITY. Letter, ATZM-FPE, Fort Pickett, Blackstone, Virginia, 28 May 1982, subject: Analysis of Soil Samples from Fort Pickett.
2. REFERENCE. Title 40, Code of Federal Regulations (CFR), 1981 rev., Part 761, Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
3. PURPOSE. To determine the presence and extent of PCBs and to provide assistance as requested in the solution of any related technical or administrative problems.
4. FINDINGS. As requested in paragraph 1, results of electron-capture, gas-liquid chromatographic and/or density analyses are inclosed. The PCBs analyzed for included Aroclor® 1016, 1221, 1232, 1242, 1248, 1254, 1260, and 1262. Per 40 CFR 761, subject fluid samples may be categorized as "non-PCB" (less than 50 ppm PCBs), "PCB-contaminated" (greater than or equal to 50 ppm but less than 500 ppm PCBs) or "PCB" (500 ppm PCBs or greater).

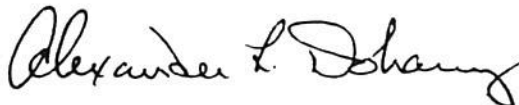
®Aroclor is a registered trademark of Monsanto Company, 800 N. Lindbergh Blvc, St. Louis, MO 63166. Use of trademarked names does not imply endorsement by the US Army, but is intended only to assist in identification of a specific product.

HSBH-RP-MO

SUBJECT: Pesticide Special Investigation No. 20-44-0956-82, Analysis of Soil
Samples for Polychlorinated Biphenyls (PCBs), Fort Pickett, Virginia,
16 June 1982

5. TECHNICAL ASSISTANCE. Further information relative to the PCB analysis may
be obtained by calling the Project Officer, Ms. Sandra Ehrhardt, AUTOVON 584-
3613/4131.

FOR THE COMMANDER:



ALEXANDER L. DOHANY

LTC, MSC

Acting Director, Radiation and
Environmental Sciences

1 Incl
as

CF:

HQDA (DASG-PSP)

Cdr, HSC (HSPA-P)

Cdr, TRADOC (ATEN)

Cdr, MEDDAC, Fort Lee (PVNTMED Actv)(2 cy)

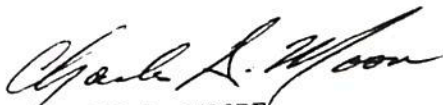
C, USAEHA Rgn Div - North

HSHB-RP-MO

SUBJECT: Pesticide Special Investigation No. 20-44-0956-82, Analysis of Soil
Samples for Polychlorinated Biphenyls (PCBs), Fort Pickett, Virginia,
16 June 1982

TABLE. Results of Analysis.

<u>SAMPLE NO.</u>	<u>USAEHA NO.</u>	<u>PCB RESIDUE (ppm)</u>
PCB-10	Sp 5532	ND*
PCB-20	Sp 5533	ND
PCB-30	Sp 5534	ND
PCB-40	Sp 5535	ND



CHARLES A. MOORE
CPT, MSC
Chief, Pesticide Analysis Branch
Organic Environmental
Chemistry Division

*No PCBs detected at a lower limit of detectability of 1 ppm.

001211
(1951)

REFERENCE 8